

Fig. 1

206/0

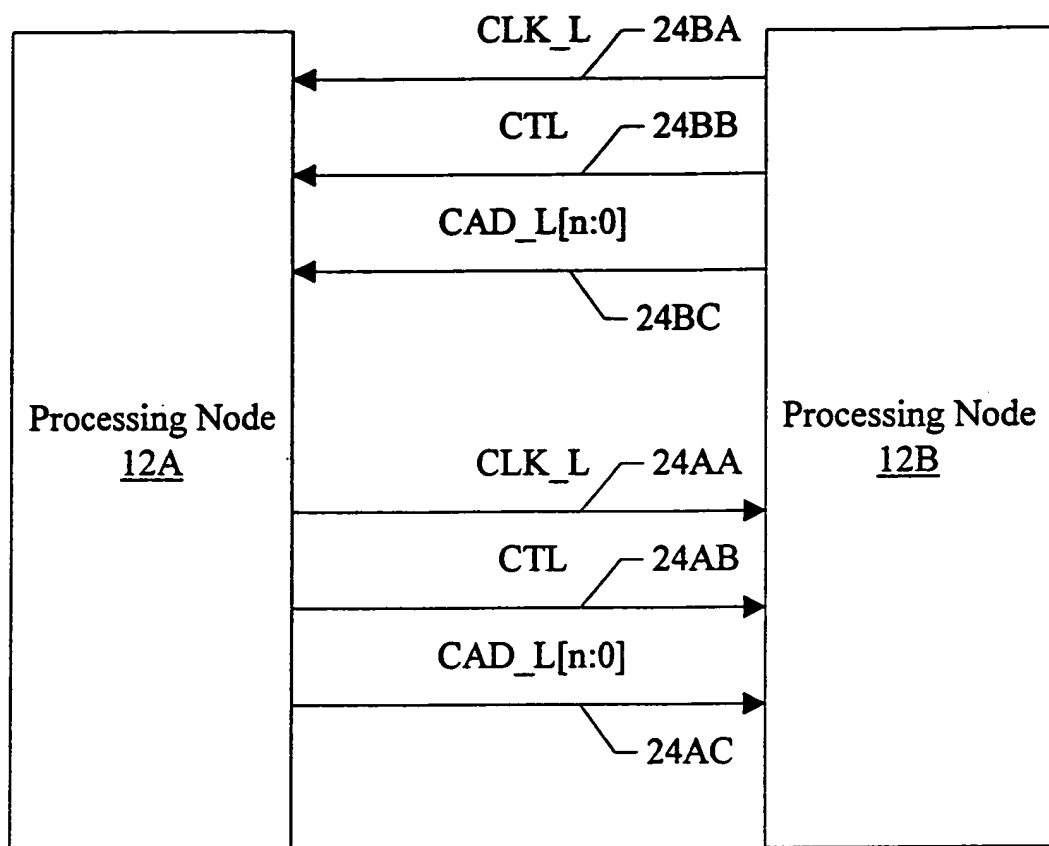


Fig. 2

| Bit Time | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|----------|---|---|----------|---|---|---|---|---|
| 1 | | | CMD[5:0] | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |

30

Fig. 3

| Bit Time | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|----------|---------------|---|----------|----------------|---|--------------|---|---|
| 1 | SrcUnit [1:0] | | CMD[5:0] | | | | | |
| 2 | DestNode[2:0] | | | DestUnit [1:0] | | SrcNode[2:0] | | |
| 3 | | | | SrcTag[4:0] | | | | |
| 4 | | | | | | | | |
| 5 | Addr[15:8] | | | | | | | |
| 6 | Addr[23:16] | | | | | | | |
| 7 | Addr[31:24] | | | | | | | |
| 8 | Addr[39:32] | | | | | | | |

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Fig. 4

| Bit Time | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|----------|---------------|---|----------|----------------|---|--------------|---|---|
| 1 | SrcUnit [1:0] | | CMD[5:0] | | | | | |
| 2 | DestNode[2:0] | | | DestUnit [1:0] | | SrcNode[2:0] | | |
| 3 | | | | SrcTag[4:0] | | | | |
| 4 | Sh | | | | | | | |

Fig. 5

| Bit Time | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|----------|-------------|---|---|---|---|---|---|---|
| 1 | Data[7:0] | | | | | | | |
| 2 | Data[15:8] | | | | | | | |
| 3 | Data[23:16] | | | | | | | |
| 4 | Data[31:24] | | | | | | | |
| 5 | Data[39:32] | | | | | | | |
| 6 | Data[47:40] | | | | | | | |
| 7 | Data[55:48] | | | | | | | |
| 8 | Data[63:56] | | | | | | | |

Fig. 6

| <u>CMD Code</u> | <u>VChan</u> | <u>Command</u> | <u>Packet Type</u> |
|-----------------|--------------|----------------|--------------------|
| 000000 | - | Nop | Info |
| 000001 | NPC | VicBlk | Command/Data |
| 000010 | | Reserved | |
| 000011 | NPC | ValidateBlk | Command |
| 000100 | NPC | RdBlk | Command |
| 000101 | NPC | RdBlkS | Command |
| 000110 | NPC | RdBlkMod | Command |
| 000111 | NPC | ChangetoDirty | Command |
| x01xxx | NPC or PC | WrSized | Command/Data |
| 01xxxx | NPC | ReadSized | Command |
| 100xxx | | Reserved | |
| 110000 | R | RdResponse | Response/Data |
| 110001 | R | ProbeResp | Response |
| 110010 | R | TgtStart | Response |
| 110011 | R | TgtDone | Response |
| 110100 | R | SrcDone | Response |
| 110101 | R | MemCancel | Response |
| 11011x | | Reserved | |
| 11100x | P | Probe | Command |
| 111010 | P | Broadcast | Command |
| 111011 | | Reserved | |
| 11110x | | Reserved | |
| 111110 | | Reserved | |
| 111111 | - | Sync | Info |

Fig. 7

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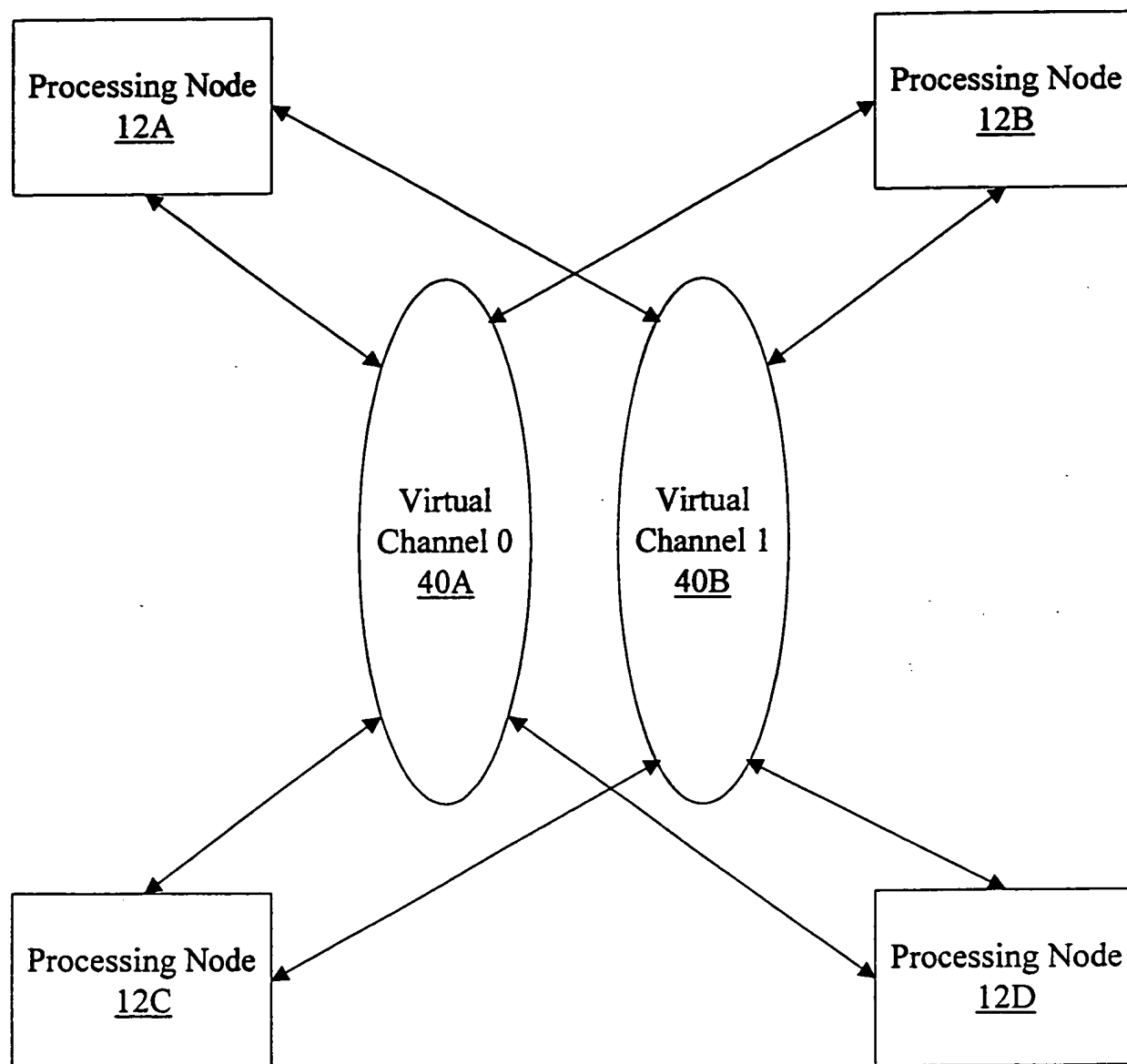


Fig. 8

Virtual Channels

| <u>Virtual Channel</u> | <u>Applicable Links</u> |
|------------------------|--------------------------|
| Posted Commands | Coherent and NonCoherent |
| Non-Posted Commands | Coherent and NonCoherent |
| Responses | Coherent and NonCoherent |
| Probes | Coherent Only |

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Fig. 9

The diagram illustrates the internal architecture of a network node 12A. At the top is the **MC 16A** (Microcontroller). Below it is the **Packet Processing Logic 58**, which is connected to **MC 16A** via a bidirectional arrow. The **Packet Processing Logic 58** is also connected to two external interfaces: **IF 18C** on the left and **IF 18A** on the right, both via bidirectional arrows. Below the **Packet Processing Logic 58** are two processing paths. The left path consists of a **Cache 54** (dashed box) connected to a **Processor Core 56** (dashed box) via a bidirectional arrow. The right path consists of a **Cache 50** (solid box) connected to a **Processor Core 52** (solid box) via a bidirectional arrow. Both the **Cache 54** and **Cache 50** are connected to the **Packet Processing Logic 58** via bidirectional arrows. At the bottom is the **IF 18B** (Interface), which is connected to the **Packet Processing Logic 58** via a bidirectional arrow. The entire system is enclosed in a dashed box labeled **12A** at the bottom left.

Fig. 10

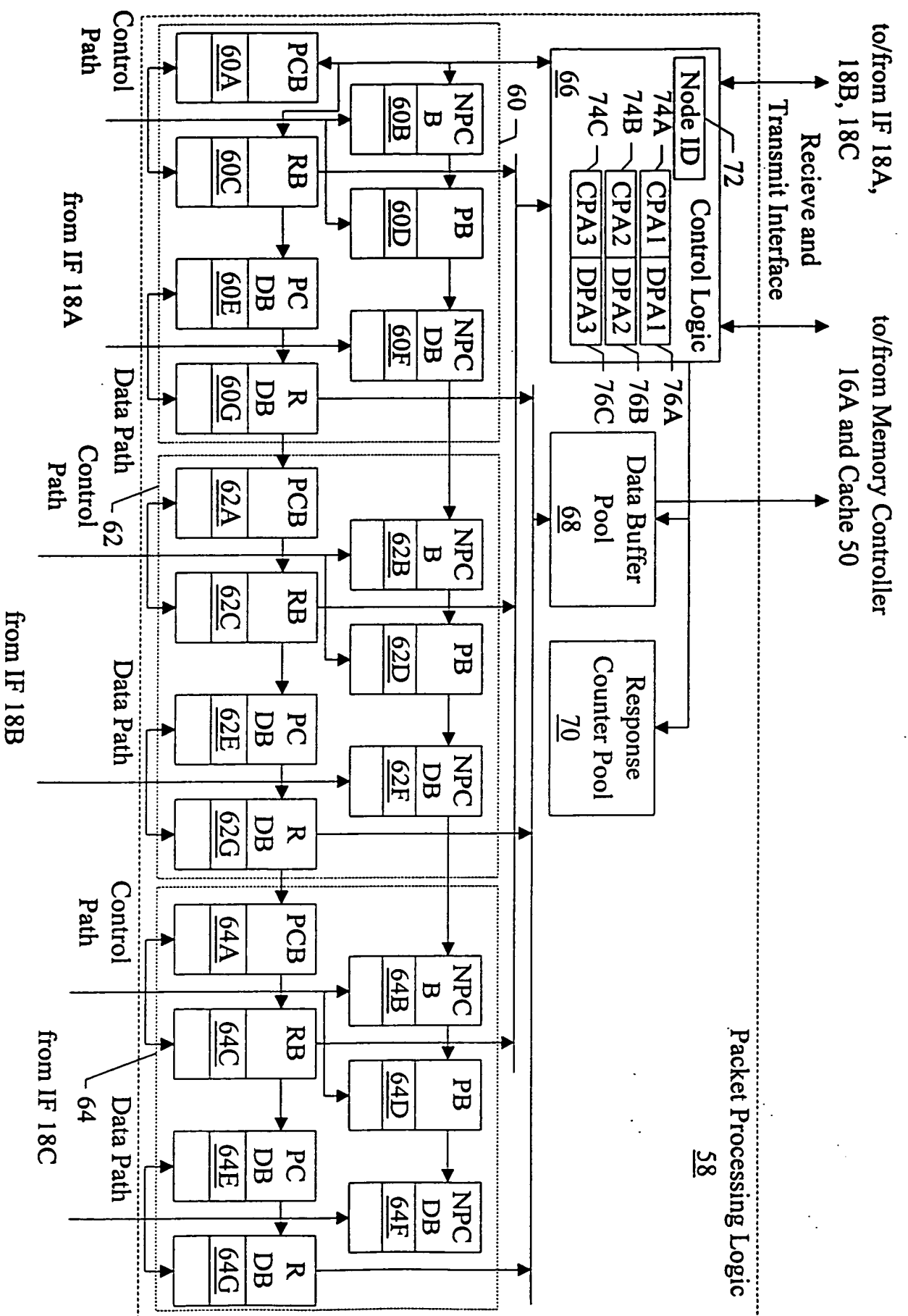


Fig. 11

09398624 091799

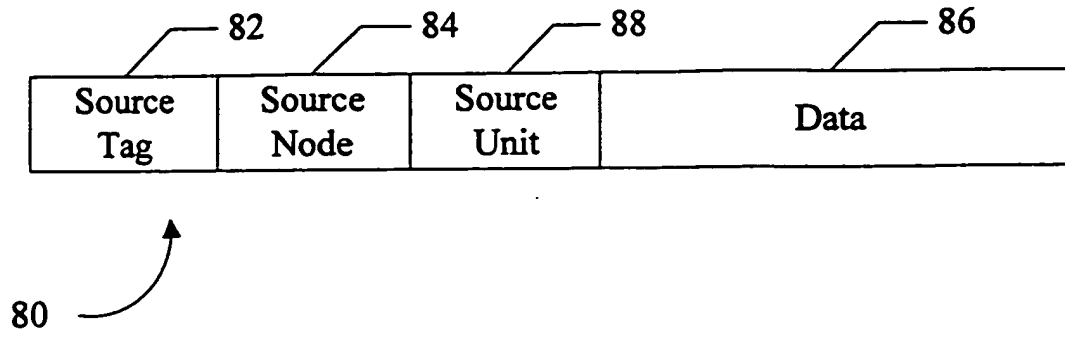


Fig. 12

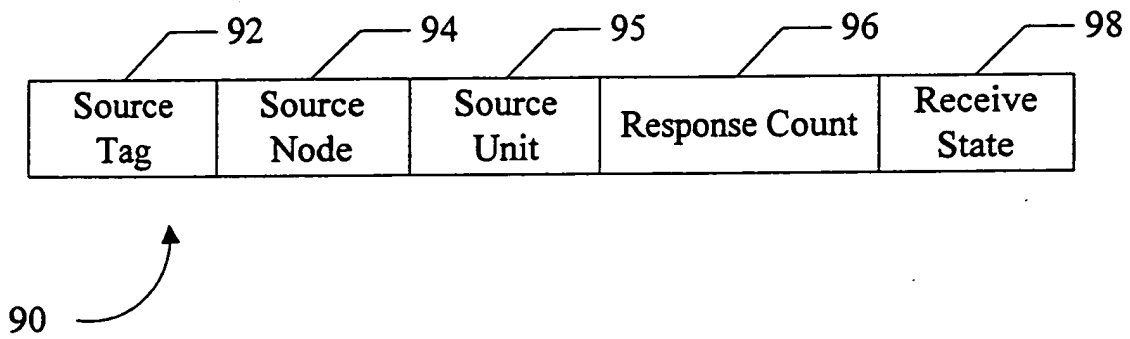


Fig. 13

66/160,423,660

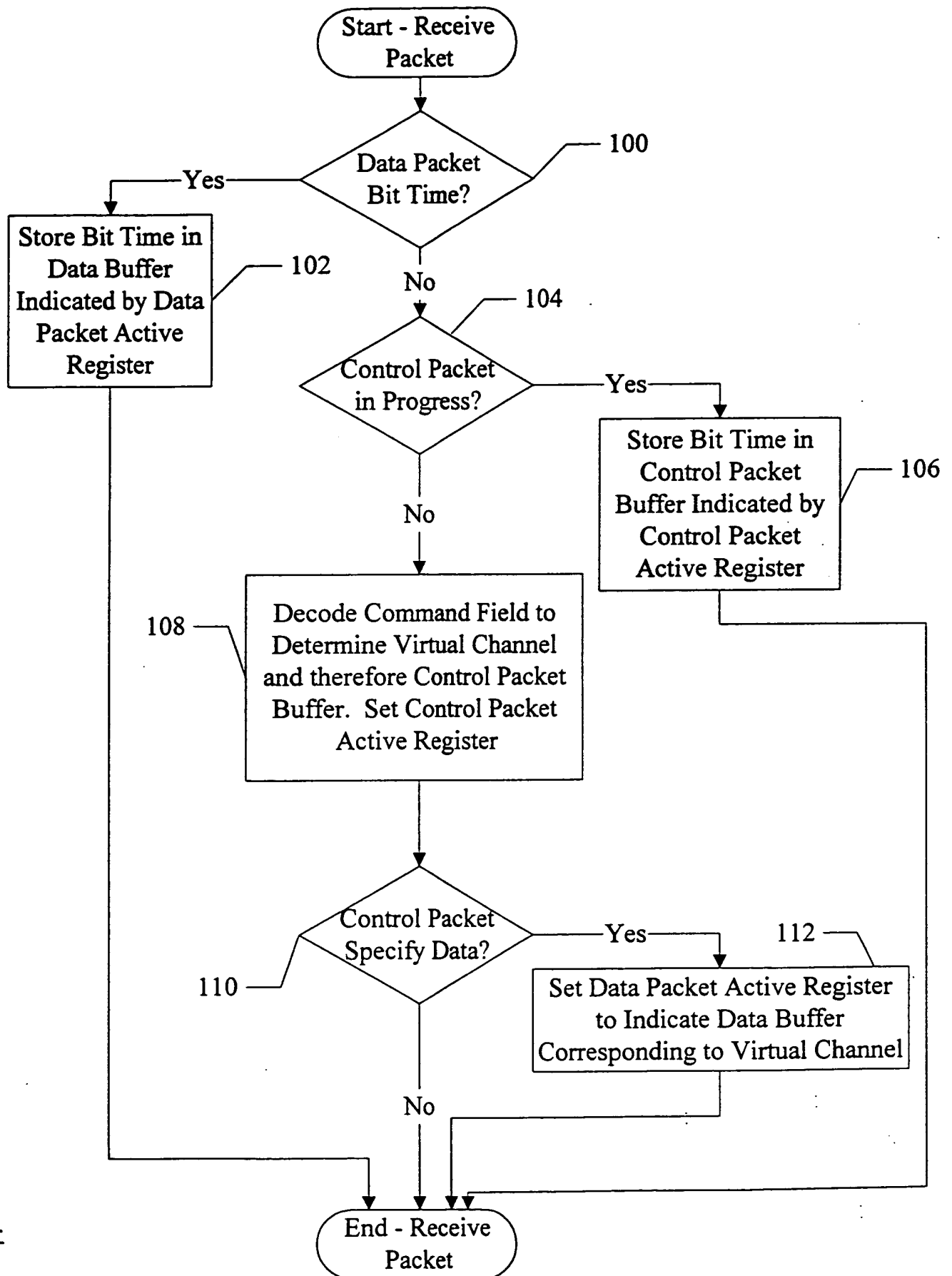


Fig. 14

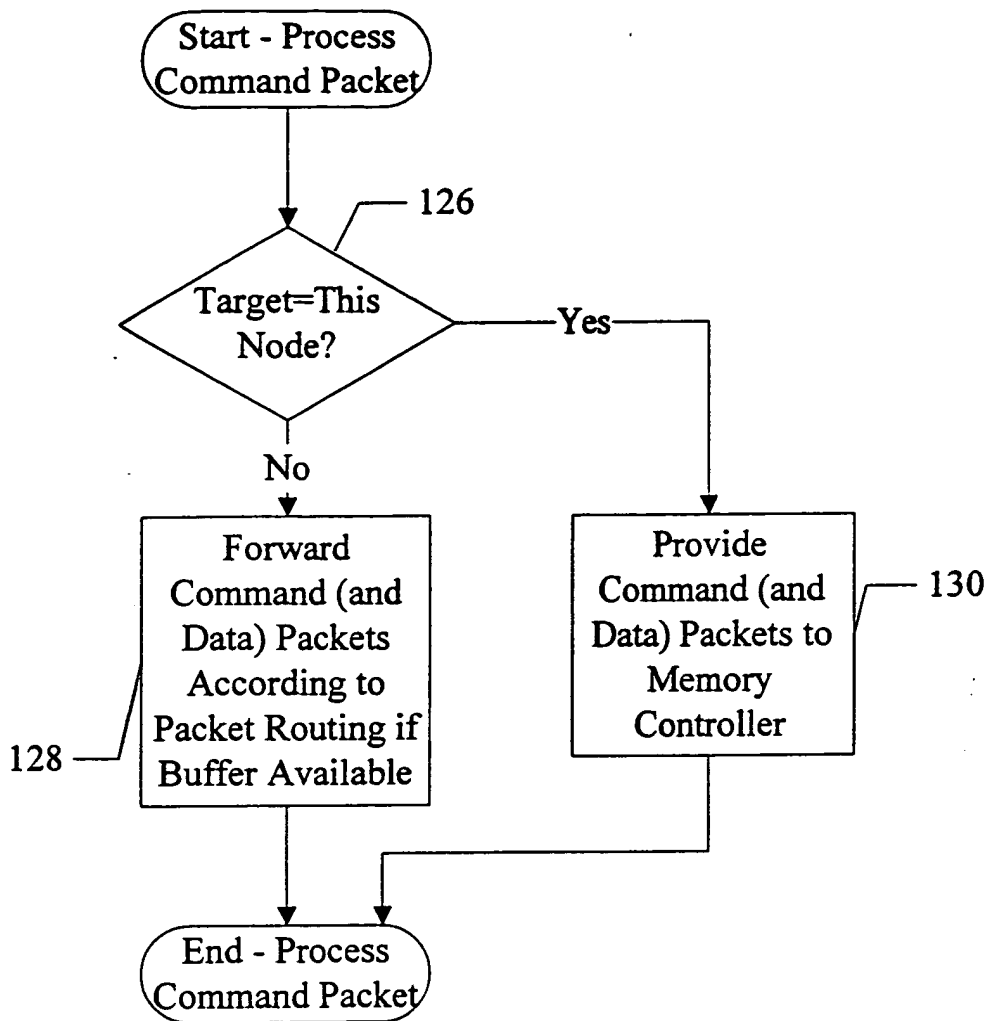


Fig. 15

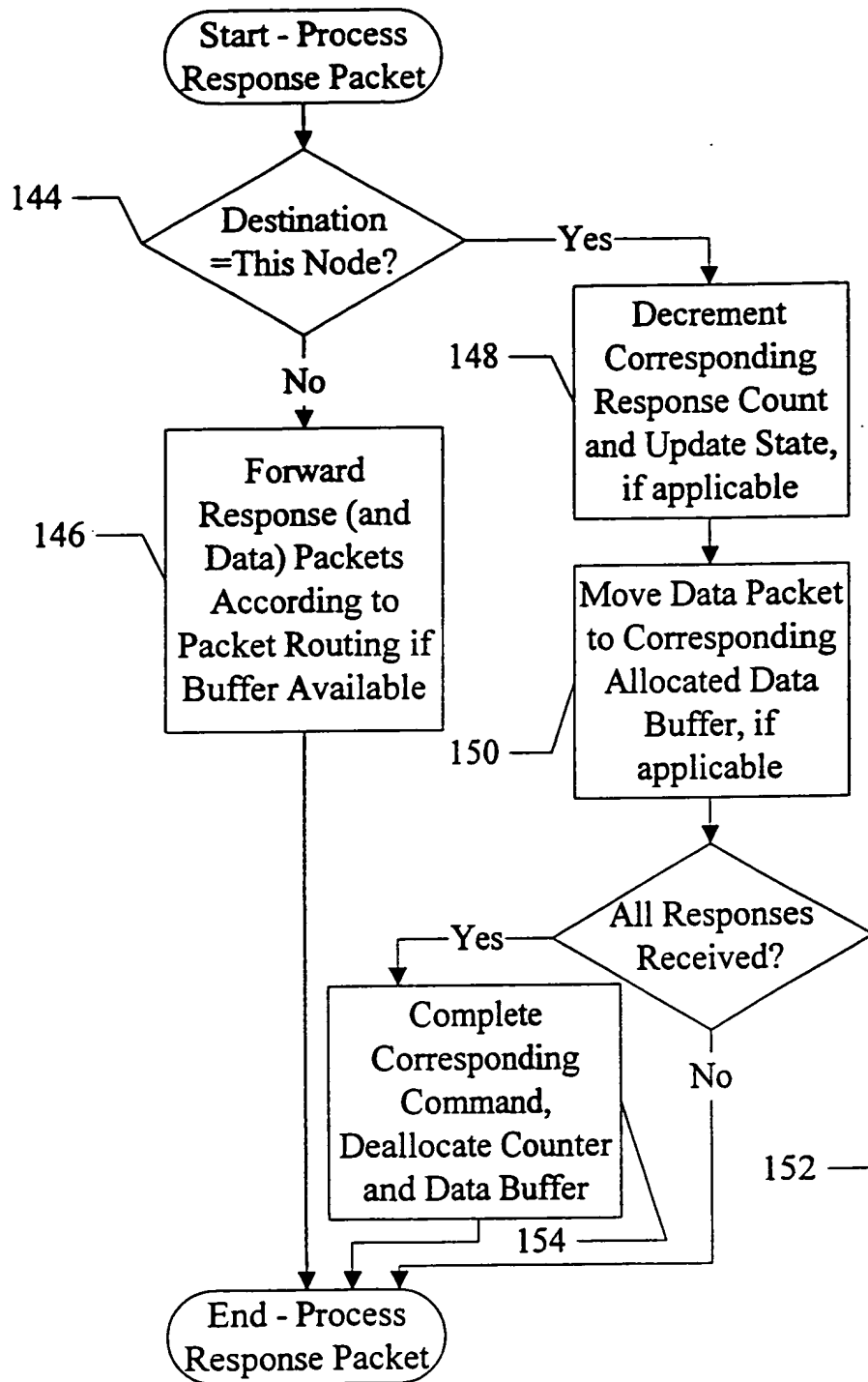


Fig. 16

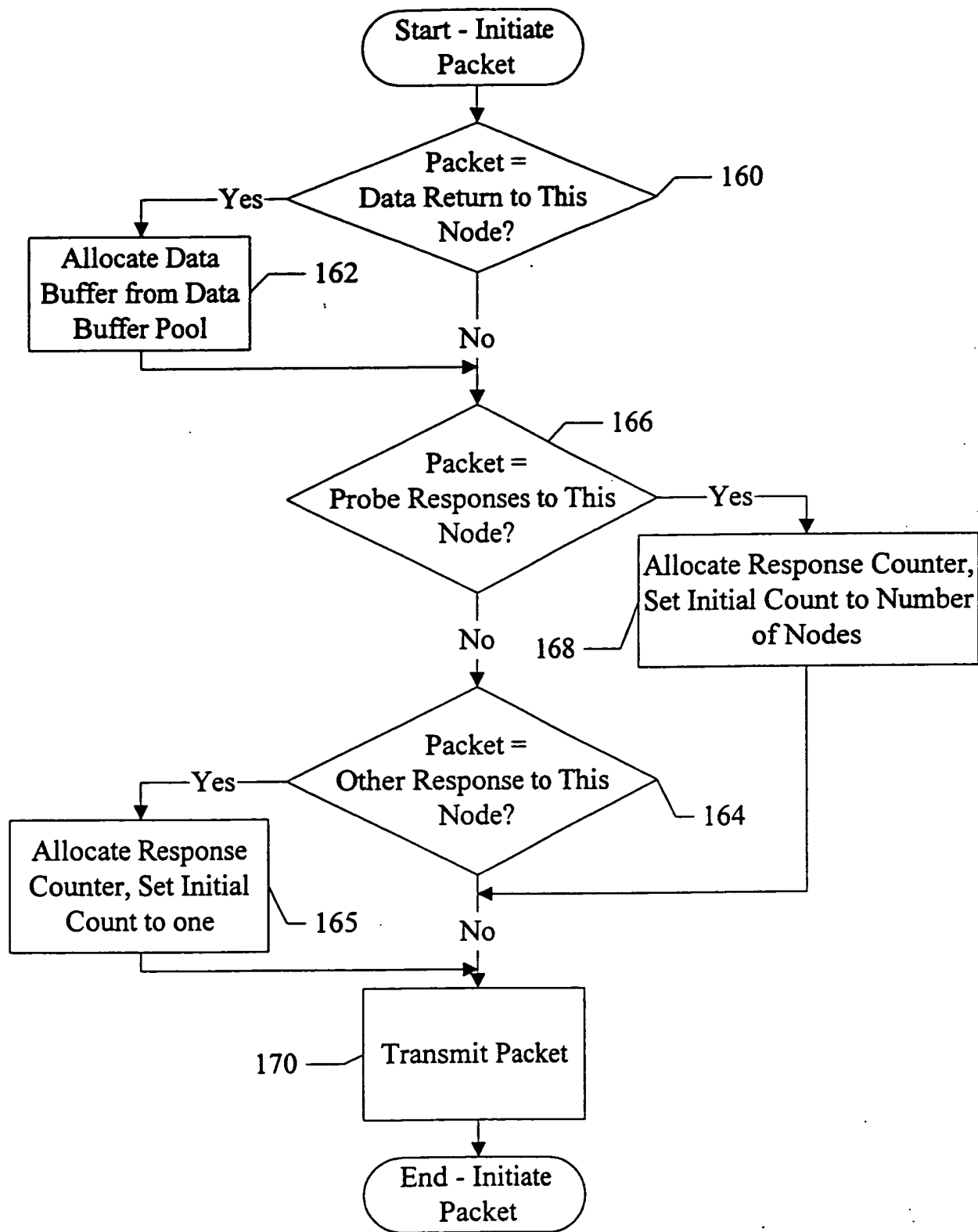


Fig. 17

| Bit Time | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|----------|----------------|---|----------------|---|-------------------|---|------------------|---|
| 1 | RSV | | CMD[5:0] | | | | | |
| 2 | RespData [1:0] | | Response [1:0] | | PostCmd Data[1:0] | | PostCmd [1:0] | |
| 3 | RSV | | Probe [1:0] | | NonPost Data[1:0] | | NonPost Cmd[1:0] | |
| 4 | RSV | | | | | | | |

180

Fig. 18

66/160" 4200660

552760 4238260

200

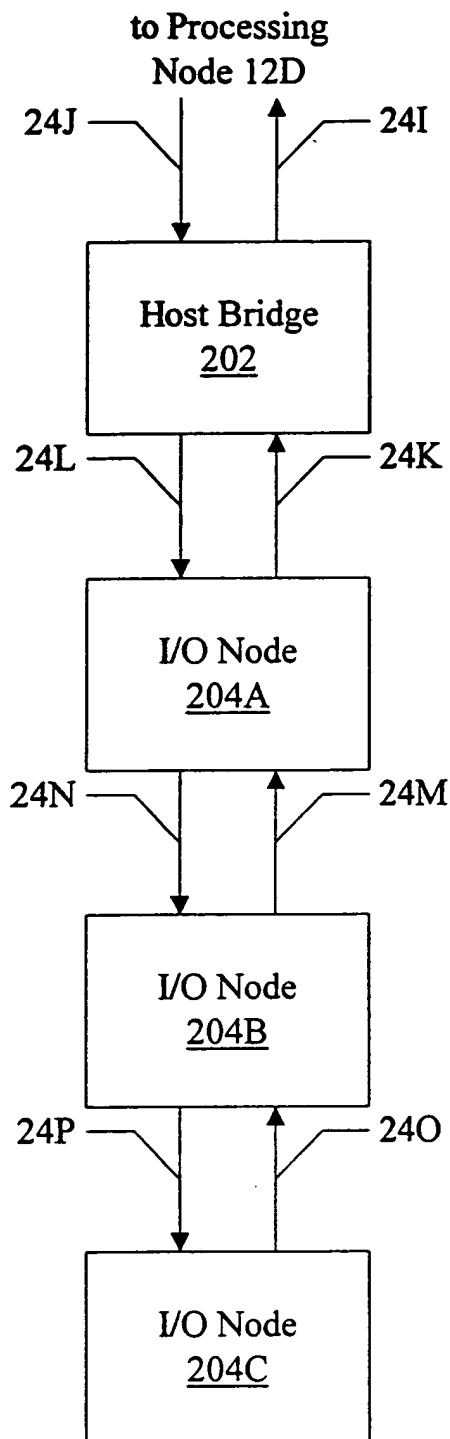


Fig. 19

| Bit Time | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|----------|-------------|------------|----------|-------------|---|---|---|---|
| 1 | SeqID[3:2] | | CMD[5:0] | | | | | |
| 2 | Pass PW | SeqID[1:0] | | UnitID[4:0] | | | | |
| 3 | | | | SrcTag[4:0] | | | | |
| 4 | | | | | | | | |
| 5 | Addr[15:8] | | | | | | | |
| 6 | Addr[23:16] | | | | | | | |
| 7 | Addr[31:24] | | | | | | | |
| 8 | Addr[39:32] | | | | | | | |

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Fig. 21

| Bit Time | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|----------|---------|---|----------|-------------|---|---|---|---|
| 1 | | | CMD[5:0] | | | | | |
| 2 | Pass PW | | | UnitID[4:0] | | | | |
| 3 | | | | SrcTag[4:0] | | | | |
| 4 | | | | | | | | |

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Fig. 22

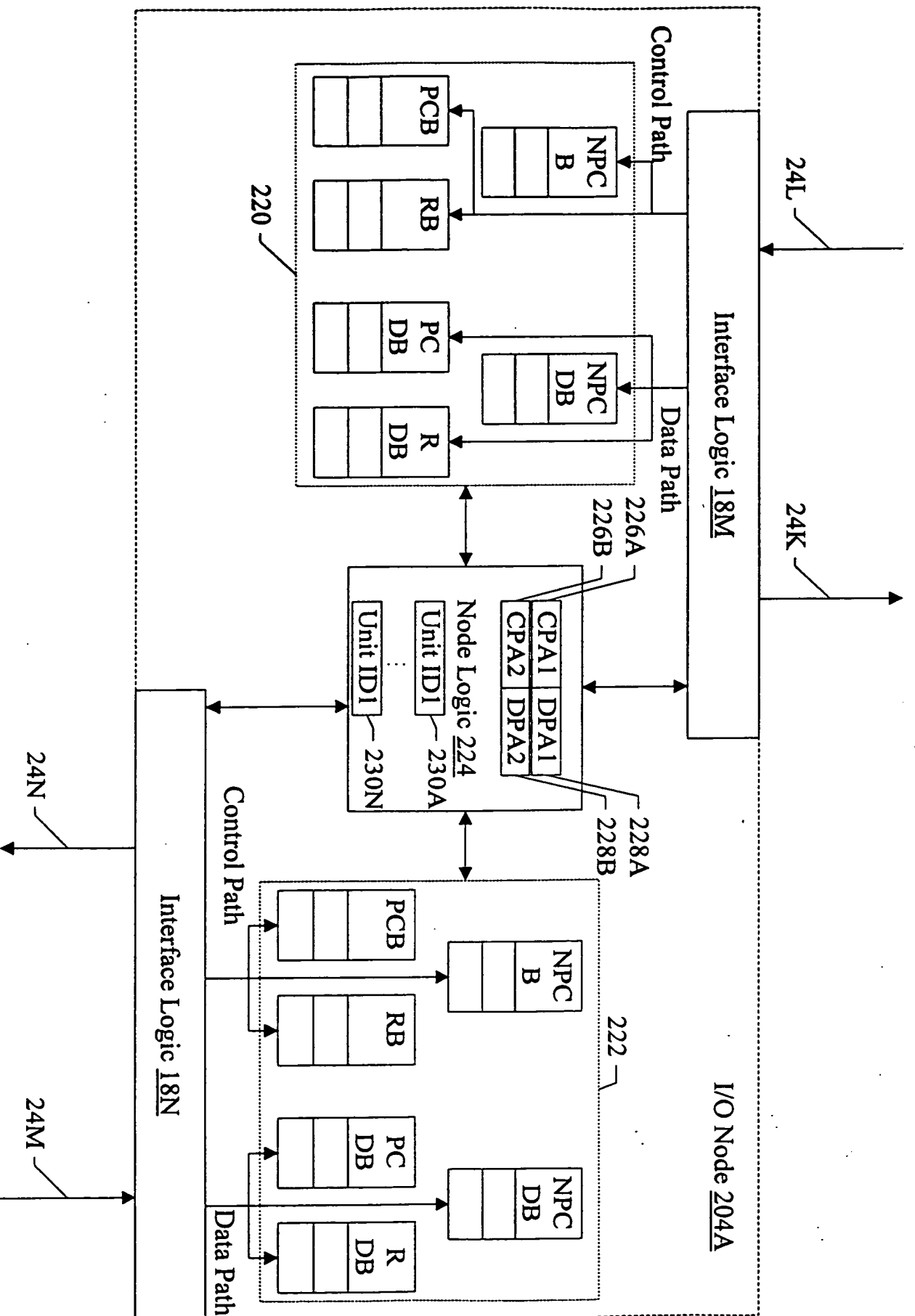


Fig. 23

09398664 091799

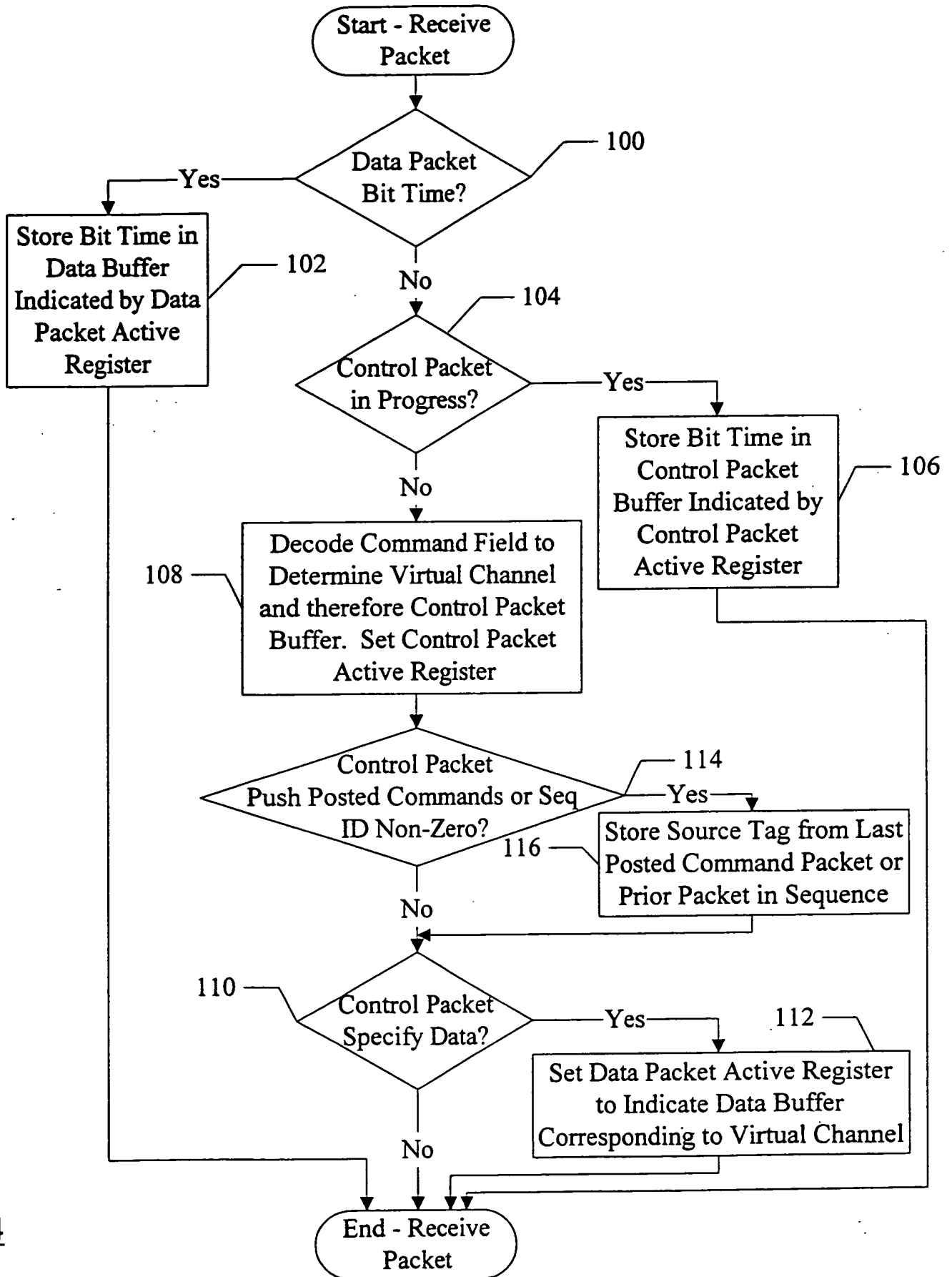


Fig. 24

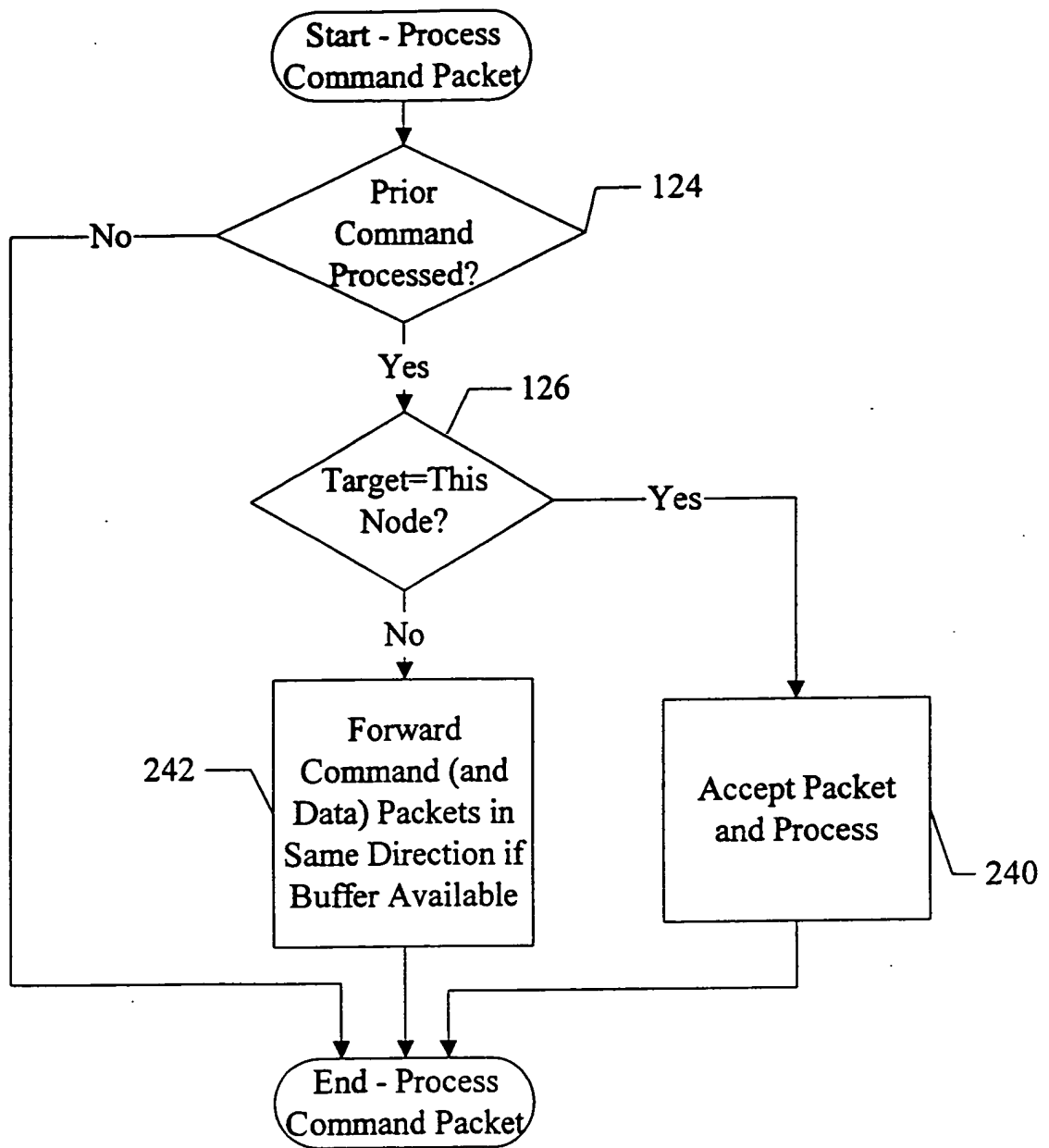


Fig. 25

0036004 091799
652760 4202560

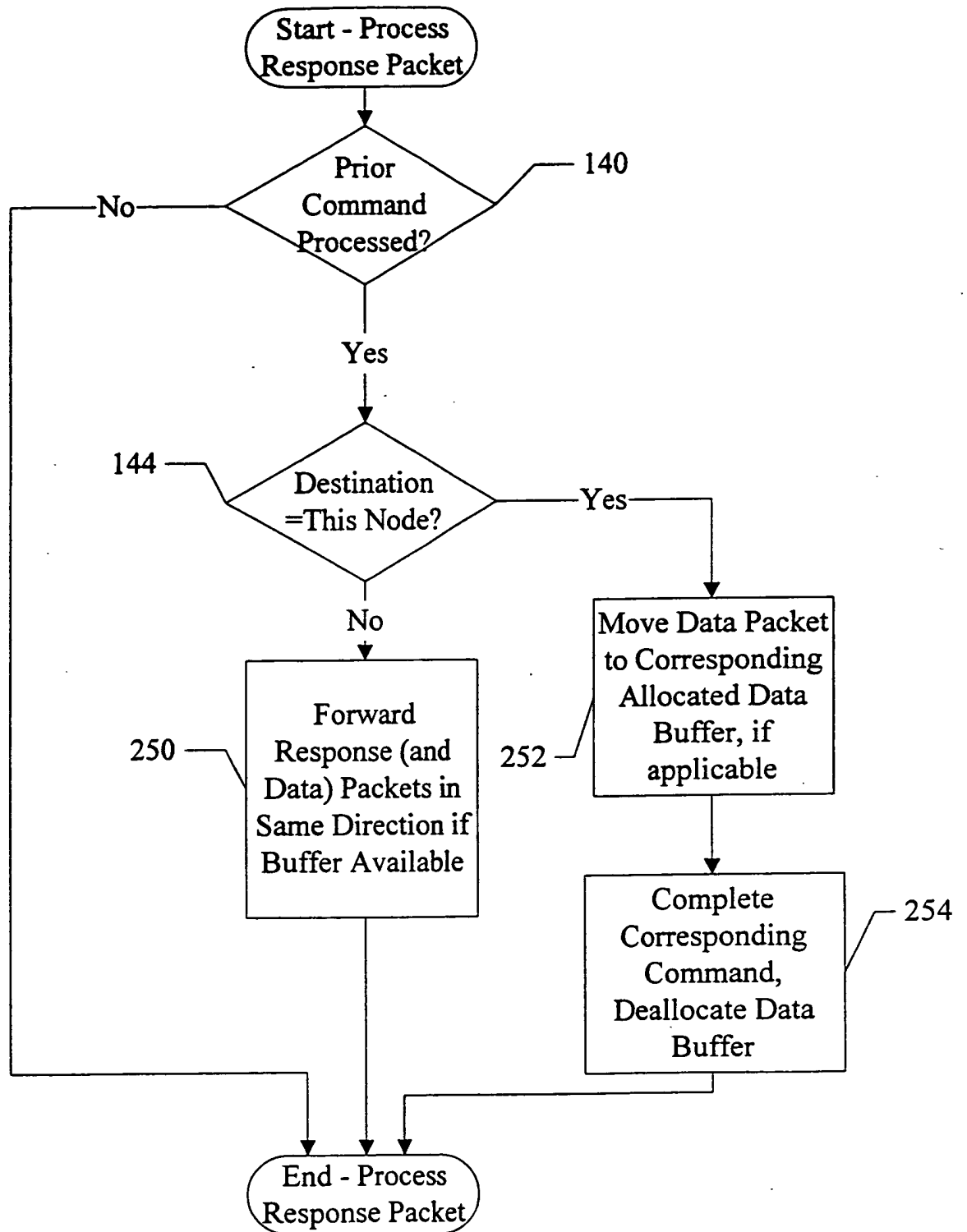


Fig. 26

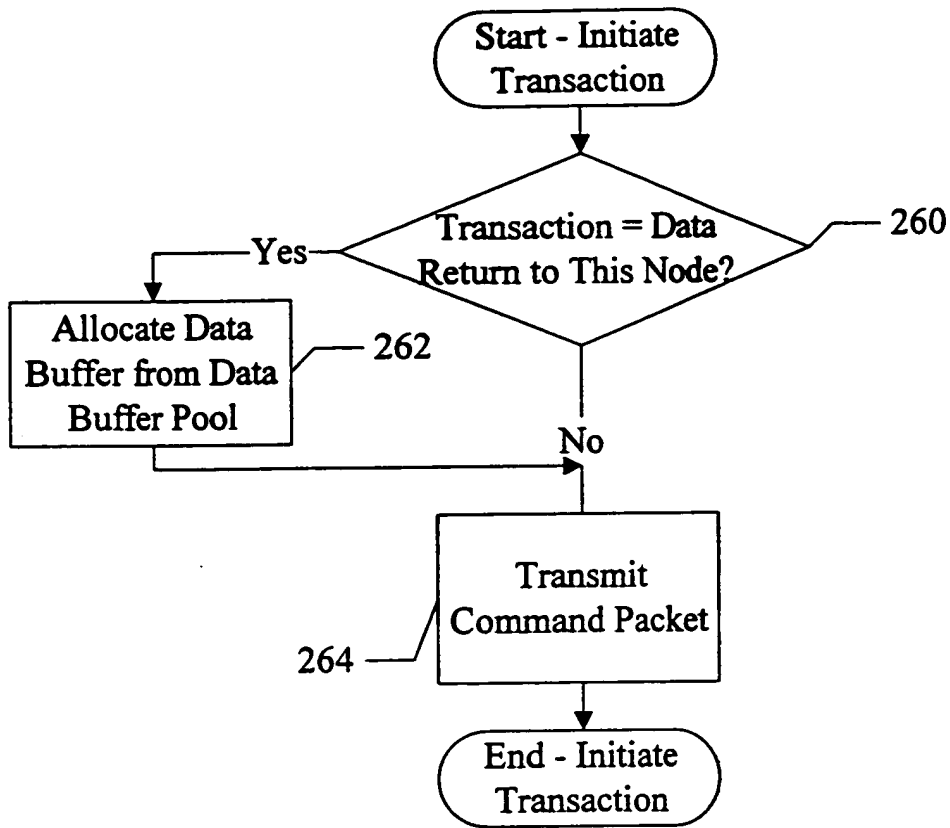


Fig. 27

09350024 091799
0002160 4200550

272

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| First Command (CMD ₁) | Second Command (CMD ₂) | Wait Requirements |
|-----------------------------------|------------------------------------|--|
| Memory Write | Memory Write | 1. CMD ₂ waits for TgtStart ₁ 2. SrcDone ₂ waits for TgtDone ₁ 3. TgtDone ₂ on Noncoherent Link waits for TgtDone ₁ on Coherent Link |
| Memory Write | Memory Read | 1. CMD ₂ waits for TgtStart ₁ 2. RdResponse ₂ on Noncoherent Link waits for TgtDone ₁ on Coherent Link |
| Memory Read | Any Memory | CMD ₂ waits for TgtStart ₁ |
| Memory Write | I/O or Interrupt | CMD ₂ waits for TgtDone ₁ |
| Memory Read | Any I/O | CMD ₂ waits for TgtStart ₁ |
| Memory Write | Flush | TgtDone ₂ on the Noncoherent Link waits for TgtDone ₁ on the Coherent Link |
| Memory Write | Response | Response ₂ waits for TgtDone ₁ |
| Memory Read | Response | Response ₂ waits for TgtStart ₁ |
| Any I/O | Any Memory, any I/O, or Interrupt | CMD ₂ waits for TgtStart ₁ |
| Any I/O | Flush | TgtDone ₂ on the Noncoherent Link waits for TgtStart ₁ on the Coherent Link |
| Any I/O | Response | Response ₂ waits for TgtStart ₁ |
| Interrupt Broadcast, Low Priority | Interrupt Broadcast | CMD ₂ waits for RdResponse ₁ |
| SysMgt Write | Response | Response ₂ waits for TgtDone ₁ |

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Fig. 28